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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,609	05/25/2006	Kohachi Tsuji	1207-133	4986
23117 7590 02/02/2011 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
WATTS, ALAN B				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/580,609

**Applicant(s)**

TSUJI ET AL.

**Examiner**

ALAN B. WAITS

**Art Unit**

3656

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 November 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 12-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 12-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-945)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiuga JP 59-212508 in view of Nakamaru USP 5732322 and in further view of Debnam USP 5927862 and Picone USP 6250815.

Hiuga discloses a similar device comprising:

#### **Re clm 1**

- A cylindrical wrapped bush bearing (fig 3)
- Said cylindrical bush bearing comprising an inner peripheral surface (3, fig 1) having a sliding surface
- An outer peripheral surface having a cylindrical surface (outside of 1, fig 3)
- One annular axial end face (right side of fig 3)
- Another annular axial end face (left side of fig 3)
- A tapered flat surface (6, fig 1-3) interposed and extending continuously in an axial direction from the one annular axial end face toward said other annular axial end face between the cylindrical surface and at least said one annular axial end face [and formed by press forming (product-by-process limitation)]

- A difference  $\delta (=r_1-r_2)$  between a radius  $r_1$  of the cylindrical surface of the outer peripheral surface and a radius  $r_2$  of an outer peripheral edge of the one annular axial end face (fig 1 and 2)

Hiuga does not explicitly disclose:

- Said difference  $\delta (=r_1-r_2)$  is in a range of not less than  $0.1t$  and not more than  $0.3t$ , where  $t$  is a wall thickness of the bush bearing at the cylindrical surface of the outer peripheral surface

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga and provide:

- Said difference  $\delta (=r_1-r_2)$  is in a range of not less than  $0.1t$  and not more than  $0.3t$ , where  $t$  is a wall thickness of the bush bearing at the cylindrical surface of the outer peripheral surface

since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Hiuga further discloses:

- The bush bearing including the sliding surface on one surface thereof and is convoluted into a cylindrical shape such that the sliding surface is positioned on an inner peripheral side
- An angle of intersection between the tapered surface and an axial line being not less than  $15^\circ$  and not more than  $25^\circ$

Hiuga does not disclose:

- The bush bearing being including a multilayered plate
- Said multilayered plate including a back plate entirely coated with copper
- A porous sintered metal layer adhered integrally to a copper coating layer on one surface of the back plate
- A sliding layer including a synthetic resin with which the porous sintered metal layer is impregnated, and which has self-lubricity and wear resistance

Nakamaru teaches:

- The bush bearing being including a multilayered plate (fig 1)
- Said multilayered plate including a back plate (1, fig 1) entirely coated with copper (col 6, ln 26-30)
- A porous sintered metal layer (col 6, ln 36-37)) adhered integrally to a copper coating layer on one surface of the back plate
- A sliding layer including a synthetic resin (3, fig 1) with which the porous sintered metal layer is impregnated, and which has self-lubricity and wear resistance

for the purpose of providing a bearing with improved corrosion resistance (col 6, ln 28-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga and provide:

- The bush bearing being including a multilayered plate
- Said multilayered plate including a back plate entirely coated with copper

- A porous sintered metal layer adhered integrally to a copper coating layer on one surface of the back plate
- A sliding layer including a synthetic resin with which the porous sintered metal layer is impregnated, and which has self-lubricity and wear resistance

for the purpose of providing a bearing with improved corrosion resistance.

The combination of Hiuga and Nakamaru would inherently provide:

- The cylindrical surface, the tapered surface and the one annular end face consisting of an exposed surface of the copper coating layer

since Nakamaru states "such strips may have been subjected to copper plating...for improving corrosion resistance". It only makes sense that the entire metal back plate would be entirely coated, otherwise, the corrosion resistance would be ineffective.

Hiuga in view of Nakamaru does not disclose:

- Said bush bearing further comprising a first smooth circular arc surface interposed between the tapered surface and the cylindrical surface
- A second smooth circular arc surface interposed between the tapered surface and the one annular axial end face

Debnam teaches a bearing (fig 6) and a housing (18, fig 4) arrangement comprising rounding corners of a bearing bush (B, fig 6) for the purpose of preventing large shear stress discontinuity caused by sharp corners.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga in view of Nakamaru and provide:

- Said bush bearing further comprising a first smooth circular arc surface interposed between the tapered surface and the cylindrical surface
- A second smooth circular arc surface interposed between the tapered surface and the one annular axial end face

for the purpose of preventing large shear stress discontinuity caused by sharp corners.

Debnam does not disclose:

- The first smooth circular arc surface having a radius of curvature which is not less than 0.1 mm and not more than 1.0 mm
- The second smooth circular arc surface having a radius of curvature which is not less than 0.1 mm and not more than 0.5 mm

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga in view of Nakamaru and in further view of Debnam to provide:

- The first smooth circular arc surface having a radius of curvature which is not less than 0.1 mm and not more than 1.0 mm
- The second smooth circular arc surface having a radius of curvature which is not less than 0.1 mm and not more than 0.5 mm

since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Debnam's bearing and housing arrangement further comprises

- The outer peripheral edge of the one annular axial end face having a smaller diameter than a diameter of a hole of the aluminum-made housing in which the bush bearing is press fitted (col 3, ln 20-22, 43)

Hiuga in view of Nakamaru and in further view of Debnam is silent as to the material which is used for the housing and how the bearing is installed into the housing.

As Picone discloses in the background, a bearing and housing arrangement having an aluminum bearing housing (col 1, ln 39) and the bearing is press fitted into the housing (col 1, ln 29-30) is well known in the art.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga in view of Nakamaru and in further view of Debnam to provide:

- An aluminum-made housing in which the bush bearing is press fitted for the purpose of providing a light and strong housing and a way to cheaply fix a bearing into said housing.

**Re clm 12 and 21**

The limitation:

- the tapered surface is formed by roll forming
- is a product-by-process limitation. See above regarding product-by-process limitations.

**Re clm 13, Hiuga further discloses**

- the peripheral surface of the bush bearing further has, in addition to the tapered surface interposed between the cylindrical surface and the one annular end face, another tapered surface (left side, fig 3) interposed



between the cylindrical surface and the other annular axial end face of the bush bearing

**Re clm 14**, Hiuga further discloses

- the other tapered surface extends in the axial direction continuously from the other annular end face (fig 3)
- the cylindrical surface extends in the axial direction from the other tapered surface toward the one axial end face of the bush bearing (fig 3)

**Re clm 15**, Hiuga further discloses

- the other tapered surface extends in the axial direction between the cylindrical surface and the other annular end face so as to be flat or convex toward the outside (fig 3)

**Re clm 16 and 18**, Hiuga does not disclose

- a smooth circular arc surface is interposed between the other tapered surface (one of two tapered ends, fig 3; Hiuga) and the cylindrical surface
- a smooth circular arc surface is interposed between the other tapered surface and the outer annular end face (1, fig 3)

Debnam teaches a bearing (fig 6) and housing (18, fig 4) arrangement comprising rounding corners of a bearing bush (B, fig 6) for the purpose of preventing large shear stress discontinuity caused by sharp corners.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga in view of Nakamaru and provide:

- a smooth circular arc surface is interposed between the other tapered surface and the cylindrical surface
- a smooth circular arc surface is interposed between the other tapered surface and the outer annular end face

for the purpose of preventing large shear stress discontinuity caused by sharp corners.

**Re clm 17 and 19**

Debnam does not disclose:

- a radius of curvature (of the first smooth arc surface) which is not less than 0.1 mm and not more than 1.0 mm
- a radius of curvature (of the second smooth arc surface) which is not less than 0.1 and not more than 0.5 mm

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Hiuga in view of Nakamaru and in further view of Debnam to provide:

- a radius of curvature (of the first smooth arc surface) which is not less than 0.1 mm and not more than 1.0 mm
- a radius of curvature (of the second smooth arc surface) which is not less than 0.1 and not more than 0.5 mm

since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

**Re clm 20**, Hiuga further discloses

- An angle of intersection,  $\theta$ , between the other tapered surface and the axial line being not less than  $15^\circ$  and not more than  $25^\circ$  (pg 50, col 1, ln 24)

**Re clm 22**, Hiuga in view of Nakamaru further discloses:

- The other tapered surface is constituted by an exposed surface of the copper coating layer (fig 3, Hiuga; col 6, ln 27-30, Nakamaru)

***Response to Arguments***

3. Applicant's arguments filed 11/11/2010 have been fully considered but they are not persuasive.

Applicant argues "Nakamaru does not disclose or suggest the tapered surface which is coated by the copper layer".

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Hiuga in view of Nakamaru does indeed disclose "the tapered surface being coated by the copper layer". If the tapered surface was not copper coated, there would not be good corrosion resistance, since that surface would be exposed and vulnerable to corrosion.

Applicant's argues of "to eliminate the occurrence of dust at the time of press fitting" and "copper materials have similar hardness to that of aluminum materials" are

both not limitations of the claims and also the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Applicant also argues that Hiuga does not disclose "the outer peripheral edge of the annular end face having the smaller diameter than the diameter of the hole of the aluminum-made housing in which the bush bearing is press fitted". The examiner points to the rejection with Debnam. Debnam clearly points out in col 3 that the annular end face has a smaller diameter than the diameter of the hole.

#### ***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALAN B. WAITS whose telephone number is (571)270-

3664. The examiner can normally be reached on Monday through Friday 7:30 am to 5 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alan B Waits/  
Examiner, Art Unit 3656

/Richard WL Ridley/  
Supervisory Patent Examiner, Art Unit 3656